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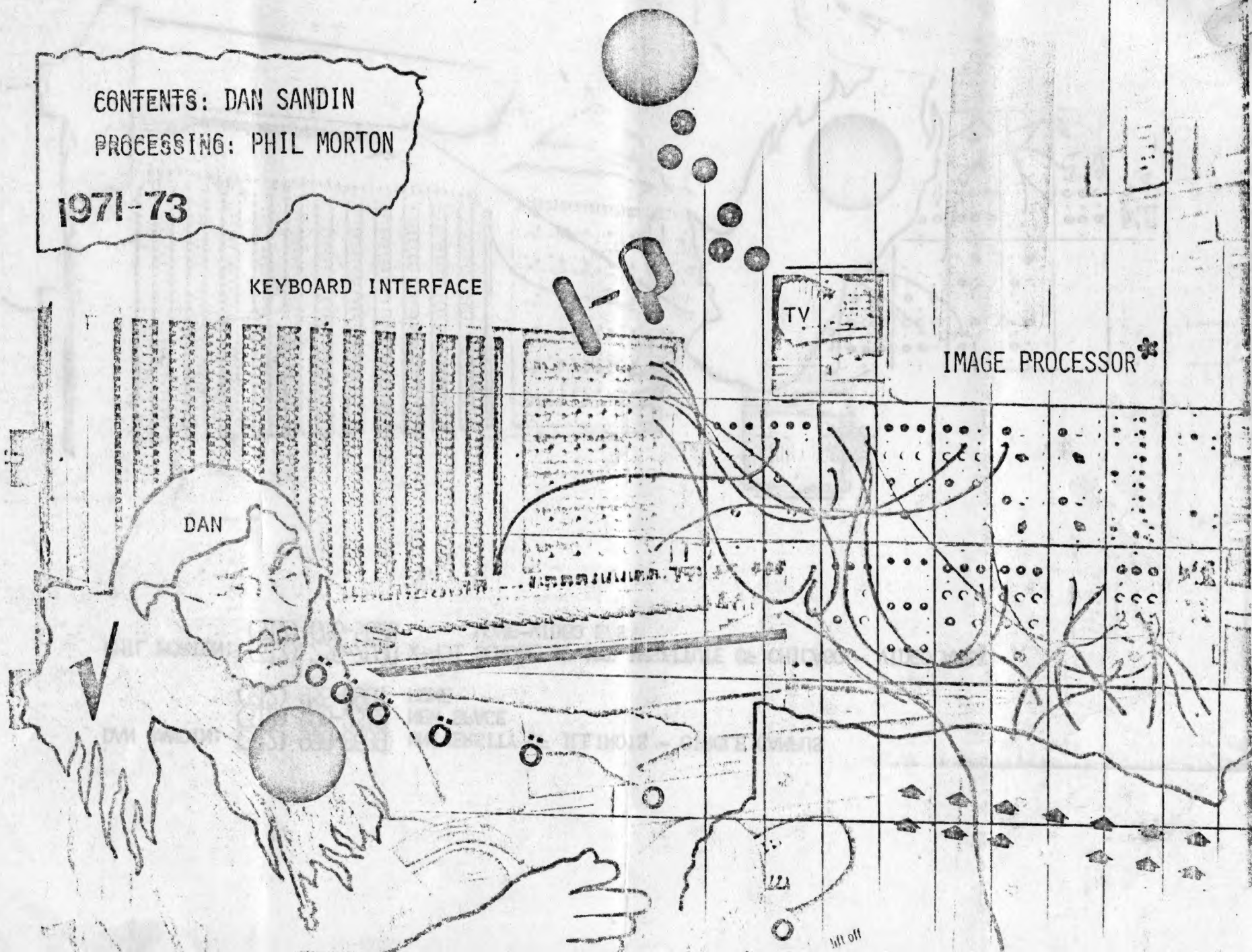
1971-73

KEYBOARD INTERFACE

TV

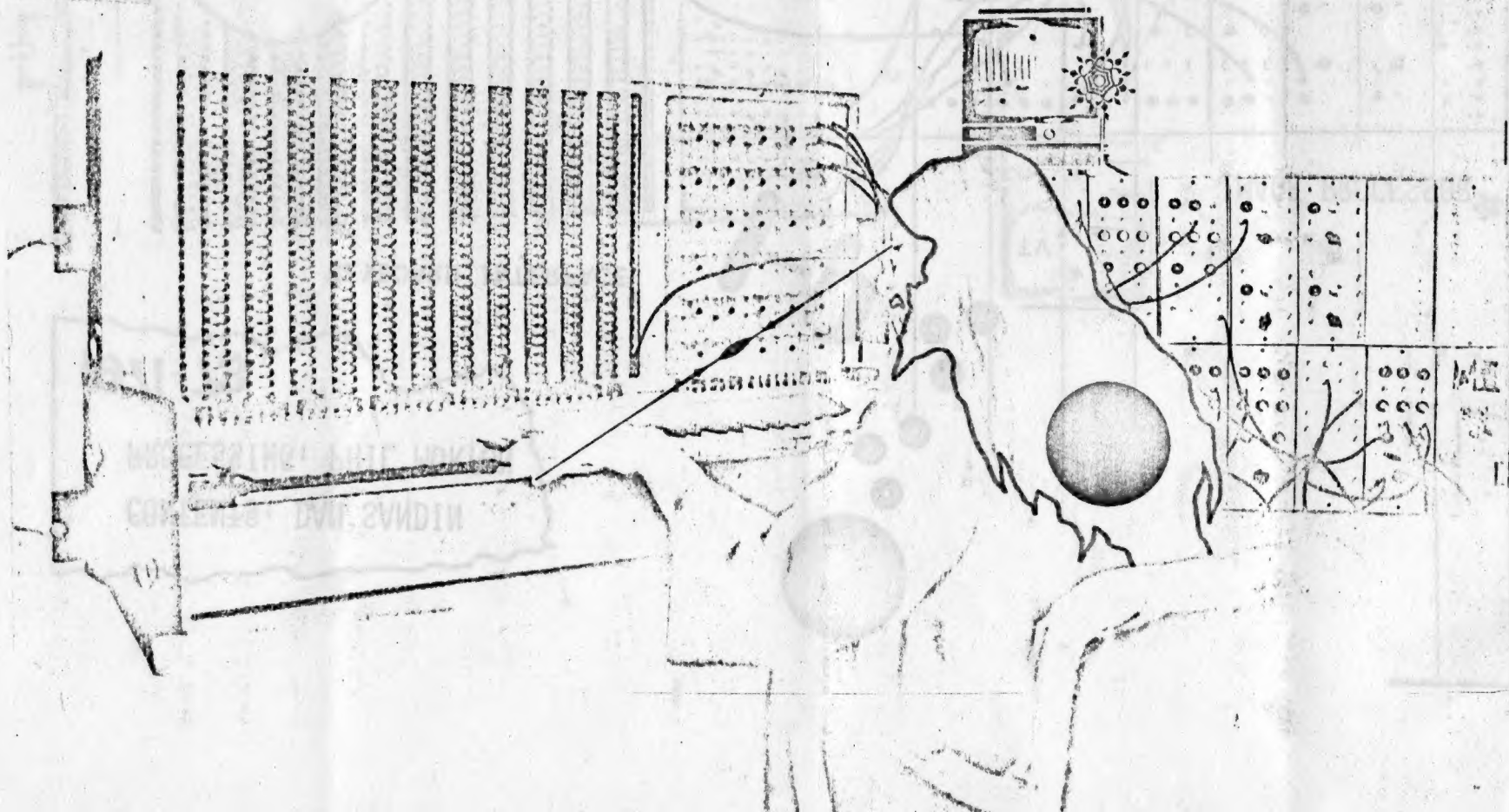
IMAGE PROCESSOR\*

DAN



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# THE DAN SANDIN IMAGE PROCESSOR

(PRESENTLY 'OPTIMIZED' FOR VIDEO SIGNALS)

*'...a member of a special class of EDUCATIONAL machines called a  
DESIGN-TOOL-LEARNING-MACHINE...'*

IN BRIEF THE IMAGE PROCESSOR (I-P) IS A PATCH PROGRAMMABLE GENERAL PURPOSE ANALOG COMPUTER WHICH IS OPTIMIZED FOR REAL-TIME PROCESSING OF IMAGES. I HAVE BEEN DESIGNING AND BUILDING IT OVER THE LAST TWO YEARS...

THE I-P ACCEPTS NATURALISTIC IMAGES, MODIFIES AND COMBINES THEM IN COMPLEX WAYS AND DISPLAYS OR STORES THE RESULT. A TELEVISION CAMERA, FILM-CHAIN, VIDEO-TAPE RECORDER OR SIMILIAR DEVICE CAN BE USED TO DECODE MOVING IMAGES IN AN ELECTRONIC SIGNAL, A FORM TO WHICH THE I-P ACCEPTS. A TELEVISION MONITOR DECODES THE SIGNAL AND DISPLAYS THE MODIFIED IMAGE. THE INSTRUMENT IS PROGRAMMED BY ROUTING THE IMAGE THROUGH VARIOUS PROCESSING MODULES AND THEN OUT TO A MONITOR OR VIDEO-TAPE RECORDER. THE MODULES ARE DESIGNED TO MAXIMIZE THE POSSIBILITY OF INTER-CONNECTION, THEREBY, MAXIMIZING THE NUMBER OF POSSIBLE MODIFICATIONS OF THE IMAGE.

This description of the image processor may sound like a sophisticated special-effects board in a television station. There is of course a similiarity. A good analogy would be to compare a desk calculator to a general-purpose digital computer; both the desk calculator and digital computer can ADD and SUBTRACT numbers. The 'digital-computer' however, can STORE a program which it executes in time...and more importantly, the 'digital-computer' can modify its program based on RESULTS of the program.

The image processor has in addition, the power to execute a program-in-time, and more importantly, to modify what modification is done based on the content of the input image and the program. The image processor is a GENERAL PURPOSE 'machine' and the special-effects board is not. Further-on than processing, the image processor synthesizes, generates, and colorizes black and white video images into COLOR .



## TABULAR COMPARISON OF TEACHING MACHINES AND DESIGN-TOOL-LEARNING-MACHINES:

### TEACHING MACHINES

### DESIGN-TOOL-LEARNING-MACHINES

#### MOTIVATION

Teaching machines usually depend on adverse external rewards, ie: grade threats of failure to encourage user to use machine...

The user is able to do what he considers to be something worth doing, ie: a problem or project of his own choice...

#### DIRECTION OF ACTION

The machine directs the user along prescribed paths with little options left to user discretion...

The user acts on the machine by structuring it to do a personally-preferred task...

#### AVAILABILITY OF STRUCTURE

The structure of the machine (the program and logic behind the program) is inaccessible, contributing to the users lack of control of the situation...

The structure of the machine is accessible to the user, allowing him more control of the learning situation...

#### PROBLEM OF VARYING LEVELS OF COMPETENCE

Must have separate programs tailored to various levels of competency with attendant placement of problems...

Because of its generalized structure users of varying levels may interact with the machine profitably...

## TEACHING MACHINES

## DESIGN-TOOL-LEARNING-MACHINES

### PACING OF USER

Although the user may go along at his own pace, he cannot skip sections in which he is not interested (and come to them later), and can usually not investigate one area to much greater depth than other users' executing the same program...

The user is in control; he may take as long or as short of a time period as he likes. He may investigate any area he desires to in depth...

### REPERTORY OF USERS' RESPONSES

#### (INPUT TO MACHINE)

Limited to a small number of specific operations, ie: pushing one of 5 to 26 buttons...

Large and varied, including keyboard, joysticks, biological and environmental sensors...

### FEEDBACK

#### (OUTPUTS OF MACHINE WHICH RESPOND TO USER'S ACTION IN-TIME)

Often delayed and usually limited to correct/incorrect with perhaps some additional information or a program branch...

Instantaneous, immediate, multi-sensual, unambiguous and varied; includes colored kinetic events, tactile audio and environmental information...

## TEACHING MACHINES

### GENERALITY

The machine is usually designed for a particular subject and requires reprogramming by other than the user, to new things...

### NU·ANCE

The teaching machine is sensitive only to gross ordering of input of information...

## DESIGN-TOOL-LEARNING-MACHINES

The machine can accomplish many tasks and can be restructured to accomplish new tasks under user control...

The design-tool-learning-machine is capable of sensing small variations of input (much information is carried in small variations of intonation, gesture, etc....)...

At yet another level the IMAGE PROCESSOR and allied machines are designed for the express purpose of modifying consciousness, increasing awareness, centering, learning, (non-linguistically) etc...

Machines whose primary function is this 'consciousness modification' are not new; a musical instrument is a good example of a machine designed to modify "'consciousness'" (what else is it used for)...

AT THE MOST IMMEDIATE LEVEL AND AT THE FINAL LEVEL IT HAS BEEN A 'JOY' WORKING WITH THE INSTRUMENT; I HAVE LEARNED A GREAT DEAL FROM IT...

The IMAGE PROCESSOR is not yet finished per se; yet it is functioning completely and perfectly. It is 'modular' in electrical and physical construction and as a result 'grows' in proportion to user-extensibility-of-desire...(lust-for-power/lust-for-subtlety)... EXPANSION-ing/EXTENSIBLE-ity is steady, slow and full-of-love for/in a cybernetic 'BEING'.